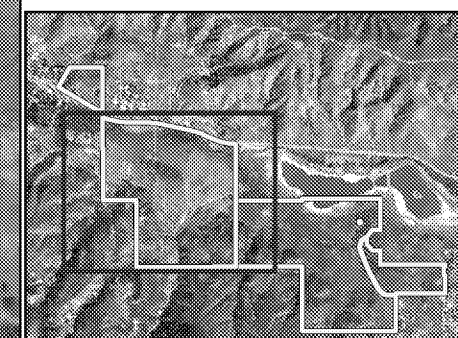


Petersen Ranch Mitigation Bank








Los Angeles County,
California

Appendix E. Delineated Aquatic Feature Comparison: 2011, 2019, 2021



0 250 500
Feet

Map Date: November 2021
Map By: NJander
Base Source: ESRI World Imagery

-  Study Area
-  2011 - Wetlands (0.07 ac.)
-  2011 - Non-wetland Waters (7.80 ac.)
-  2019 - Wetlands (2.72 ac.)
-  2019 - Non-wetland Waters (10.61 ac.)
-  2021 - Wetlands (1.53 ac.)
-  2021 - Non Wetland Waters (10.61 ac.)

APPENDIX I – FLASH GRAZING SUMMARY

2021 FLASH GRAZING SUMMARY MEMO

PETERSEN RANCH MITIGATION BANK

LEONA VALLEY, LOS ANGELES COUNTY CALIFORNIA



USACE FILE No. SPL-2012-00669-BEM
CDFW TRACKING No. 1798-2013-04-R5
RWQCB FILE No. 15-052

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NOVEMBER 2021



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Attachment 1 Site Photographs

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1.0 Introduction

This memo summarizes the 2021 flash grazing activities and results in the Petersen Ranch Mitigation Bank's (Bank; Figure 1) Rift Valley that occurred this year per the Bank's Flash Grazing Guidance Manual (WRA 2021). This memo satisfies the reporting requirement for implementing flash grazing as adaptive management and is submitted to the Interagency Review Team (IRT) as an appendix to the Bank's 2021 Annual Monitoring Report.

1.1 Background

In 2020, an abundance of non-native, invasive annual grasses (collectively "invasive annual grasses"), including rip gut brome (*Bromus diandrus*; CAL-IPC Moderate), red brome (*Bromus rubens*; CAL-IPC High), and hare barley (*Hordeum murinum* ssp. *leporinum*; CAL-IPC Moderate), was documented in the Rift Valley during annual vegetation monitoring in Area A of the Bank. As such, a document was prepared to provide guidance regarding flash grazing seasonal wetland meadows and immediately surrounding areas (WRA 2021a).

The Bank, approved in 2016, is currently operating within the Interim Management Period and is thereby held to the conditions contained in the approved Interim Management Plan (IMP; BEI Exhibit D-4). Per Section 4.1.4 of the IMP, one such condition is that grazing will adhere to the requirements contained the Long-Term Management Plan's Grazing Plan (BEI Exhibit D-5, Appendix B). While the majority of the Bank is an active cattle ranch, the Rift Valley seasonal wetland meadows are located within a cattle exclusion zone as outlined in the BEI, Exhibit C-1 Development Plan, Section 5.1. These areas have not been grazed since the Bank was established in 2016. However, as detailed in the BEI Exhibit D-5 Long-Term Management Plan, Appendix B Grazing Plan:

Occasionally, grazing within the exclusion areas may be desirable to control invasive species or a build-up of thatch or fuels. If deemed necessary for management objectives, and subject to IRT approval, grazing in these areas would be conducted after the end of season rains, but while grasses are still green. Careful timing of grazing after rains have stopped and the ground has hardened will protect soil stability around wetlands and will prevent excess nutrient inputs into the downstream waters. Grazing while grasses are still green will prevent cattle from overutilizing riparian vegetation as cattle preferentially forage on protein rich grasses when available and will be less inclined to loaf in riparian habitats when temperatures are cool (BEI Exhibit D-5, Appendix B, page 6).

In 2021, the IRT approved the Flash Grazing Guidance Manual (WRA 2021a), which focuses on efficient control of non-native grass species while protecting native wetland communities and structure within the Rift Valley cattle exclusion zone. While currently only approved for use in 2021, the plan provides recommendations that can be implemented over time as-needed in the Rift Valley cattle exclusion zone.

The goals of the flash grazing adaptive management effort are to:

1. Reduce stress on native plant species in Rift Valley wetland communities;
2. Increase habitat quality for native plants and animals;
3. Control early rapid growth of invasive annual plants by timing flash grazing to begin before the start of the period when annual grasses are growing rapidly; and
4. Reduce the evapotranspiration of soil water during native perennial grass dormancy by reducing biomass of annual grasses.

1.2 Purpose of Report

Per the approved Flash Grazing Guidance Manual, a summary memo of flash grazing activities and flash grazing reporting metrics will be provided to update the IRT on the effectiveness of this grazing approach. The purpose of this report is to communicate the 2021 flash grazing activities and details on metrics related to the flash grazing and potential impacts to plants, soil, and water quality.

1.3 Modifications to Grazing Plan

The approved Flash Grazing Guidance Manual envisioned phased grazing across four pastures, Pastures A-D. Following implementation in 2021 and in response to *in situ* site conditions, the Rift Valley was instead divided into three pastures, Pastures 1-3. The pasture map has been revised to depict this change and is shown in Figure 2.

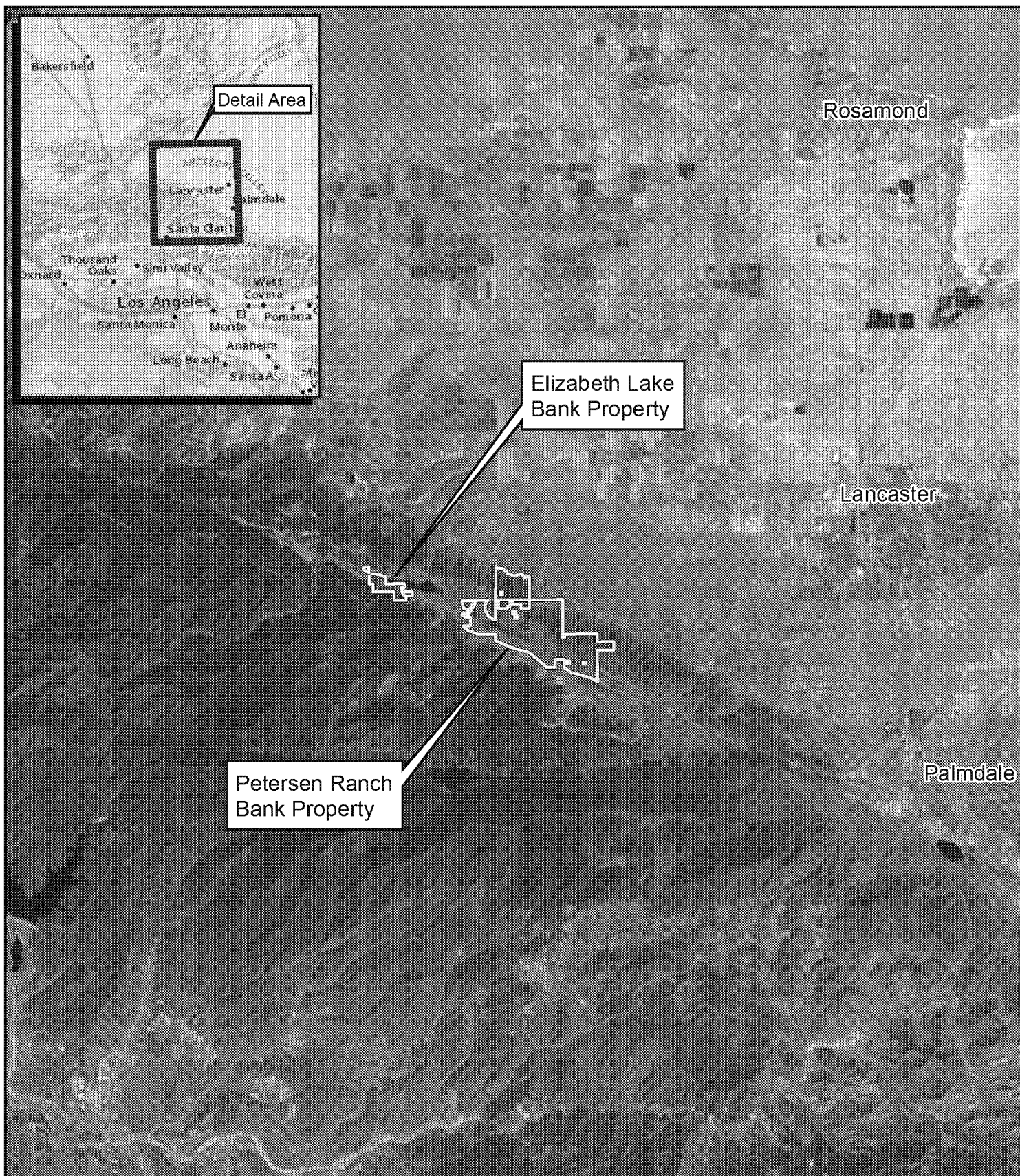


Figure 1. Project Location Map

Petersen Ranch Mitigation Bank
Los Angeles County, California



0 3.5 7
Miles



Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Microsoft 5/8/2010

Figure 2. Flash Grazing Pasture Map (Revised June 2021)



Legend

Excluded From Bank

Gate

Petersen Ranch Mitigation Bank Boundary (By Area)

Flash Grazing Area

Lahontan RWQCB Jurisdictional Boundary

Cattle Water Trough

0 500 1,000 2,000 Feet



2.0 Flash Grazing Reporting Metrics

This section provides results from each reporting metric listed in the Flash Grazing Guidance Manual.

2.1 Grazing Season and Stocking Rate

Reporting Metric: Document the beginning and end of all grazing activities, including any suspensions of grazing activity or uses of attractant. Whenever grazing begins in any of the Rift Valley pastures, document the number of cattle and their livestock class. Additionally, any augmentations to the stocking rates should be documented.

Results: Stocking rate for all pastures and rounds of grazing were 50 cow/steer and 20 calves. Flash grazing started in mid-April and ended in mid-June. Dates of flash grazing are provided in Table 1. The duration of each round of flash grazing exceeded the recommendations provided in the Manual but the grazing periods were stopped when appropriate stubble height was reached (Section 2.2.).

Table 1: Flash Grazing Timing by Pasture

PASTURE	ACRES	ROUND 1 START DATE	DURATION	ROUND 2 START DATE	DURATION
1	53.55	4/23/2021	13 days	6/11/2021	11 days
2	52.43	5/6/2021	19 days	6/22/2021	14 days
3	56.26	5/25/2021	17 days	N/A	N/A

2.2 Stubble Height

Reporting Metric: Actively grazed Rift Valley pastures should be monitored daily to ensure that the average stubble height is four inches or taller. If portions of the pasture are below the minimum allowable stubble height, attractants can be used to focus grazing away from these areas. If the average stubble height across an entire pasture is less than four inches, grazing in that pasture should be suspended or ended if it is clear that the invasive annual grasses will not regrow.

Results: Pastures 1 and 2 received two rounds of grazing to get the average stubble height below 4 inches. However, it only took one round in Pasture 3 to shorten the stubble to below the 4-inch threshold.

Table 2: Stubble Height

PASTURE	GRAZING ROUND	AVERAGE STUBBLE HEIGHT START (INCHES)	AVERAGE STUBBLE HEIGHT END (INCHES)
1	Round 1	12	8
	Round 2	8	3
2	Round 1	13	8
	Round 2	8	3
3	Single Round	10	3.5

2.3 RDM and Indicators of Rangeland Health

Reporting Metric: Residual Dry Matter (RDM) monitoring should be conducted annually in October. In concurrence with RDM monitoring, indicators of degrading rangeland health, such as erosional features, compaction, and plant mortality and decadence, should be documented.

Results: RDM monitoring was completed on October 28-29, 2021. Twenty six samples were taken in varying vegetation types throughout the Rift Valley. Vegetation types fell into three categories: native dominated, mixed, and non-native dominated. Native dominated vegetation types primarily consisted of Mexican rush (*Juncus mexicanus*), beardless wild rye (*Elymus triticoides*), and salt grass (*Distichlis spicata*). Mixed vegetation types consisted of slender wheatgrass (*Elymus trachycaulus* ssp. *trachycaulus*), meadow barley (*Hordeum brachyantherum*), and invasive annual grasses. Non-native dominated vegetation types consisted of invasive annual grasses and short-podded mustard (*Hirschfeldia incana*). No indicators of rangeland health that would signify degradation, such as erosion or compaction, were observed in the Rift Valley. The results of the RDM monitoring are summarized in Table 3.

Table 3: 2021 Flash Grazing RDM Results

VEGETATION TYPE	AVERAGE OF RDM (G)	AVERAGE OF LBS/ACRE
<i>Pasture 1</i>		
Native Dominated	15.71	1,571
Mixed	19.69	1,969
Non-native Dominated	5.49	549
<i>Pasture 2</i>		
Native Dominated	24.76	2,476
Mixed	14.20	1,420
Non-native Dominated	7.57	757
<i>Pasture 3</i>		
Native Dominated	25.08	2,508
Mixed	9.46	946
Non-native Dominated	10.60	1,060
<i>Overall</i>		
Native Dominated	23.23	2,323
Mixed	13.40	1,340
Non-native Dominated	7.78	778

2.4 Water Quality Protection

Reporting Metric: To protect water quality, grazing will be limited to periods when there is no standing water or saturated soils present. The weather should be monitored daily for rain events, and the pastures checked after every rain event. If cattle are grazing a Rift Valley pasture and precipitation forecast calls for more than 0.25" of rain, the cattle will be moved from the pasture until the rain event has passed and the soil is dry.

Results: During flash grazing, soils were not saturated and there were no areas with visible standing water. No rain events occurred within the grazing window.

2.5 Soil Compaction

Reporting Metric: Despite the absence of soils with high susceptibility to compaction, livestock classes with the least weight will be preferentially selected for flash grazing activities within the exclusion areas. Soil compaction will be qualitatively evaluated daily by Ranch staff in concert with stubble height monitoring. Compaction monitoring will rely on visual observations of indicators of soil compaction such as deep hoof prints, or areas of smooth bare soil surface. If excessive soil compaction is observed, adaptive management measures such as placement of supplemental salt or hay in upland or transition areas away from wetlands within the exclusion zone will be considered. Grazing will not occur when soils are saturated.

Results: No visual signs of soils compaction were recorded.

2.6 Site Photographs

Reporting Metric: Photo monitoring of the Rift Valley Pastures should be conducted weekly during the grazing season and monthly outside of the grazing season.

Results: Photos from the first rounds of grazing in Pastures 1 and 2 are provided in Attachment 1. The ranchers did not take photographs of the Pasture 3.

3.0 Discussion

While the threat of invasive annual grass has not been completely eliminated, the 2021 flash grazing activities were a resounding success, with an average of 0.73% absolute cover and 4.57% relative cover of invasive annual grasses across the Rift Valley cattle exclusion zone (WRA, 2021b). By reducing the prevalence of invasive annual grasses, the goals of reducing stress on native plants and reducing soil water evapotranspiration during native perennial grass dormancy were both achieved. Though stress on native plants and evapotranspiration were reduced, the overall lack of precipitation this year did not allow for significant native plant growth. Habitat quality was also improved by reducing the amount of invasive annual grasses in the Rift Valley, but these improvements were minor mainly due to the lack of precipitation and native growth. Finally, due to the timing of seasonal weather patterns, lack of precipitation this year, and the late implementation of grazing activities, invasive annual grass control was implemented after the initiation of rapid growth in the invasive annual grasses.

As expected the forage production of the Rift Valley was higher than what is described in the Antelope Valley Area Soil Survey (Woodruff, 1970), as evidenced by the RDM measurements. This resulted in a longer duration of grazing activities in order for the utilization of the invasive annual grasses to reach the desired state. However, RDM measurements and personal observations indicate that the cattle nearly completely avoided native wetland grasses and graminoids, and the longer duration grazing was not detrimental to native plant species or sensitive wetland and upland habitats. In future years, when flash grazing is utilized in the Rift Valley, the grazing should be allowed to continue until the utilization of the invasive annual grasses has been completed. It may be possible to shorten the duration of grazing by increasing the stocking rate, but at present, the risk of compaction appears to be a greater threat to native plant species and habitat quality than the utilization of native plants.

4.0 References

Woodruff, G.A., 1970	Soil Survey, Antelope Valley Area, California. US Soil Conservation Service.
WRA, Inc. 2016	Petersen Ranch Mitigation Bank Enabling Instrument (BEI). May 2016. Leona Valley, Los Angeles County, California.
WRA, Inc. 2021a	Flash Grazing Guidance Manual for Petersen Ranch Mitigation Bank. April 2021. Leona Valley, Los Angeles County, California.
WRA, Inc. 2021b	2021 Annual Monitoring Report. November 2021. Leona Valley, Los Angeles County, California.

ATTACHMENT 1 – SITE PHOTOGRAPHS

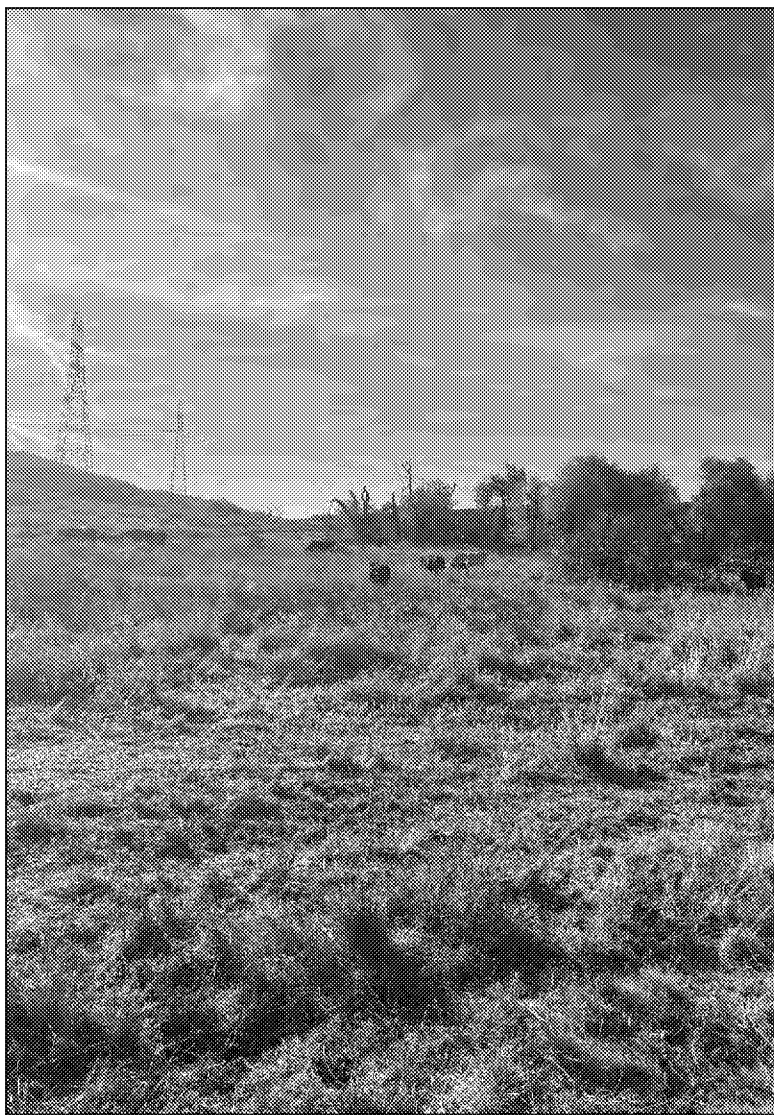


Photo 1: Pasture 1, April 30, 2021



Photo 2: Pasture 1, April 30, 2021



Photo 3: Pasture 1, May 3, 2021



Photo 4: Pasture 1, May 5, 2021



Photo 5: Pasture 2, May 14, 2021

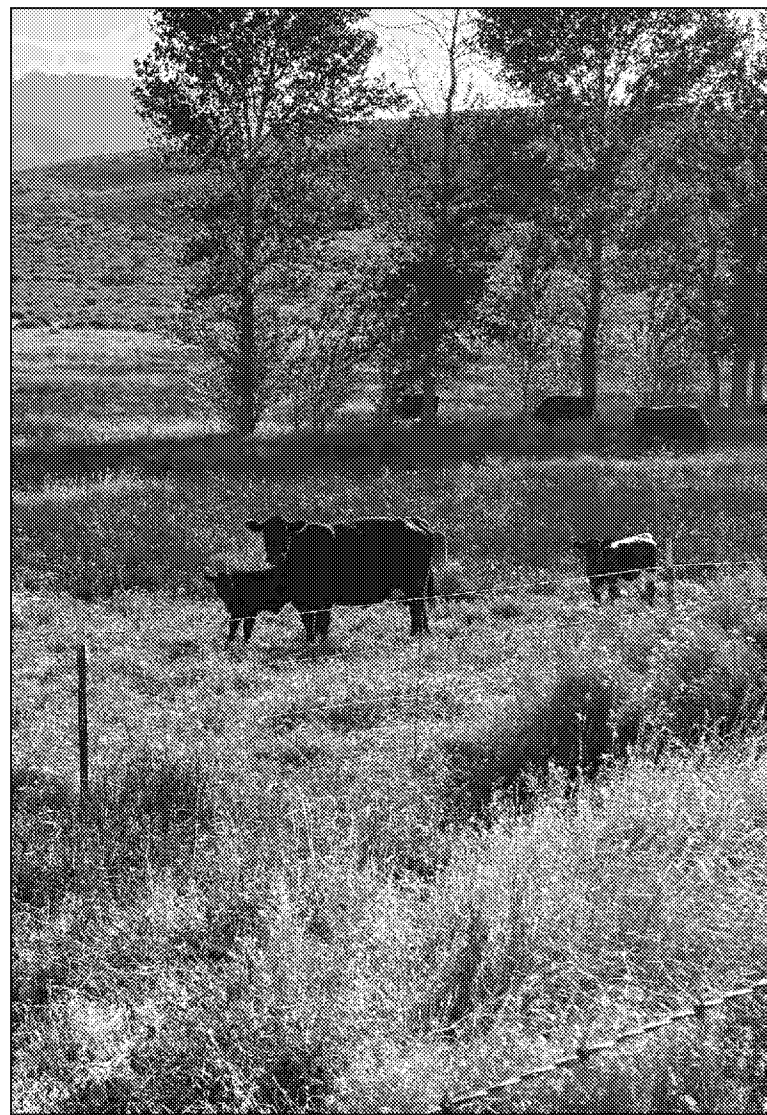


Photo 6: Pasture 2, May 14, 2021



Photo 7: Pasture 2, May 18, 2021

APPENDIX J – GROUNDWATER WELL GRAPHS

Ex. 4 CBI

Ex. 4 CBI

Ex. 4 CBI

Ex. 4 CBI

Ex. 4 CBI

Ex. 4 CBI